DATA PROCESSING DIGEST

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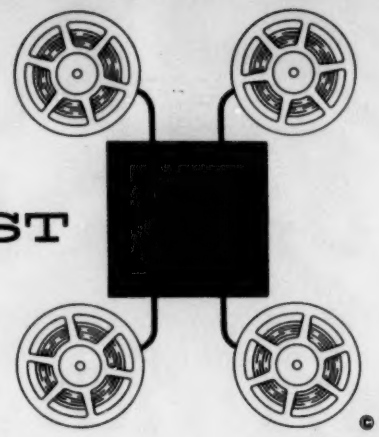

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Management Sciences

CAN THE CONTEMPORARY EXECUTIVE COPE WITH THE COMPUTER CHALLENGE?

E. D. Dwyer, Chief, Navy Management Office
An Address before the Life Office Management Association, April 15, 1959

The speaker gave as the sub-title to his address, "Electronic Computers--You Can Lead a Boss to Order, But You Can't Make Him Think!" As this implies, the substance of the address was that top management is responsible for the generally abysmal showing of electronic data processing, because top management refuses to think creatively and daringly about the real job of management.

In fact, says the speaker, "whenever and wherever a computer installation has failed to achieve any truly astounding or significant improvements in management, I am utterly convinced that the responsibility for the failure must be assumed by top management." He believes "the desire on management's part for immediate results in realizing marginal economic benefits.... reflects management myopia in its most chronic, advanced stage." Management that thinks of electronic computers in terms of trying to save money is not really thinking at all. Furthermore, "if we agree that a computer can do anything we instruct it to do, then why isn't it obvious that the failure of a computer to deliver the hoped-for output is the fault of the one issuing the instructions?... If we wish to improve management, we should study management rather than computers." That is, the Board of Directors and the officers of the company and those who are responsible for expending company funds should study themselves, their attitudes, objectives, techniques, and limitations--"foremost of which may well be a lack of vision or an atrophied imagination."

" 'Decision' is the essential problem of management; and information is both the basis and the result of the decision-making process.... Intuitive wisdom no longer suffices as the supreme management tool. In recent years management control has become increasingly dependent upon a flow of information that pervades the entire and often widespread organization. The manager rarely 'observes' performance, and only slightly more frequently does he hold first-hand 'hearings' on performance. As a result, the manager

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is primarily dependent upon written reports. Similarly, the manager generally communicates his desires by written orders, directives, and instructions. This directive/report data flow constitutes the management information system; and the manager is the focal point. This system concept embraces the entire data flow cycle, including origination of source data, its communication, manipulation, summarization, correlation, etc., to final filing or disposal.

Thinkers, doers, word-passers

"Now, it can be readily appreciated that the processing of data represents one of the major areas of effort in a management information system.... This aspect of computer utilization, however, is the least significant of three ways in which an advanced computer installation can serve management." Management is considered as a "thinker," the productive or sales force as "doers," and the office force as "word-passers" between the "thinkers" and the "doers." "In this three-way orientation we can then identify most electronic computer applications in the business world to date as representing an improved facility in the area of the 'word-passers' or data massagers (sic).... but in terms of improving the effectiveness of the 'doers' they promise almost unheard of advantages." For example, in the insurance business, "time must be expended on learning insurance lore, polishing-up pitches, lining-up contacts, and journeying from one customer to another. Still, the only real pay-off time is the time spent in confronting the customer. No matter how necessary and unavoidable are all other expenditures of time, they are not directly productive and hence represent a debit against one-hundred percent effectiveness.

"Now, let's reflect upon this a little further. We should immediately begin to discern a vast array of related management considerations. Consider the time lost only in journeying from customer to customer. This gives rise to such questions as: who are the best potential customers, where are they located, and how many are there. These considerations prompt another series of questions such as: what is the optimal geographical distribution of our agents, what is the optimal number of agents required, etc. Now I realize these questions may well mark me as a naive neophyte, but I can tell you this--nobody has yet really resolved these questions even on a quasi-scientific basis."

"The essential job of the manager is 'to make decisions.'" This entails an evaluation of an ever-increasing number of relevant factors, from which a computer can effectively filter out essential information and present it in more timely and useful form. "Nevertheless, and no matter how advanced the data processing system may be, the manager is ultimately and inevitably confronted with the necessity of quickly making vital decisions on the basis of a cursory evaluation of a multiplicity of conflicting factors replete with imponderable and hidden implications.... Even the most abundantly endowed and enlightened modern-day manager does not have time to select the best of many possible alternatives.... He needs help. The electronic computer aided and abetted by the management scientist can provide it. But it is precisely at this point that we arrive at the dual-pronged

Are managers afraid of computers?

nub of what I suspect is the real problem." First, most first-line executives won't admit they need help. Second, those who do admit computers might help are afraid they will also show up management's limitations and deficiencies.

However, "the computer can at best only be an ally, adjunct, or extension to the mind of the manager.... Only the manager can supply the necessary criteria for assigning priorities, relative worths, and other indices of comparative logic."

Management should be "impractical"

But in addition to making judgments from data at hand, the manager must approach his job of managing in the most creative manner, and in areas far remote from the computer's capabilities. In contrast to the usual procedure for correcting something wrong by finding a "practical man" to do the job, what is really needed is "an impractical man... a theorist.... When a thing will not work, then you need a 'thinker'--a man with some doctrine as to why things work at all." Management cannot "expect computer programers to initiate revolutionary new applications" nor can they expect "management analyst or systems surveyors to initiate startling new management concepts. If any of these people could do these things--then certainly they wouldn't need top management at all."

"The truly sad fact of the matter is that all of us apparently reach plateaus of complete mental complacency. We scorn computers because they have to be instructed in precise detail as to what to do. Then, we illogically condemn them for failing to achieve startling results, when we haven't fed in any startling ideas.... We should worry less about the mechanical incompatibility of one computer with another computer, and worry more--even exclusively--about the growing incompatibility of computers and managers.... I see no point in congratulating ourselves on a small job well done, when the big job remains undone. It's not that I'm against computers being used on small or conventional work to save money. Rather, it's more of a case of my being for computers being used on big or unconventional work to make money."

((We feel DPD readers (and their top management associates) should read this address in its entirety. Mr. Dwyer has said very neatly what others have been trying to say. Write for information on obtaining a copy of the address to: Life Office Management Association, 110 East 42nd Street, New York 17, New York.))

OPERATIONS RESEARCH IN RETAILING

Roger R. Crane; Touche, Niven, Bailey & Smart
Published by National Retail Merchants Association

A short resume of the meaning and scope of operations research is followed by summaries of OR applications in three retail problems: the allocation of floor space, night openings, and inventory management.

The report concludes with these words: "OR and EDP are growing rapidly and they complement each other in many problems of analysis and control in business and industry. They can be expected to continue to complement each other in producing far-reaching changes in present operations. Such changes are particularly likely in retailing because of the important advances in inventory management and related problems, but this all depends on enlightened store management recognizing the potential and working to extract the full practical benefit from advancing techniques."

The report may be obtained from the National Retail Merchants Association, 100 West 31st Street, New York 1, New York.

General Information

COMPUTER POWER: A PUBLIC UTILITY?

Alan O. Mann, Philco Corporation
COMPUTERS AND AUTOMATION, April, 1959

Business lags behind military in imaginative computer use

In general, business has not begun to tap the power of computing systems to the extent the government and armed forces have. The military seeks out all types of electronic equipment for systems which are organized for decision-making, rather than isolated "applications." Electronics manufacturers, while "largely renting to business firms product lines of computers with varying degrees of power... are producing for the military total systems of much greater power and scope." Businesses should be formulating concepts and future plans with such systems in mind. Examples of this kind of thinking in military operations and in some large businesses include: Army Ordnance Supply System, Air Materiel Command, Strategic Air Command, Aviation Supply Office of the Navy, Navy BuPers, Naval Gun Factory, Marine Corps, Carborundum, Sylvania, DuPont, U.S. Steel, Alcoa, Western Electric, General Electric and others.

Telemetering has been included in systems designed for the aircraft and continuous processing industries, including General Electric and DuPont, and smaller concerns such as Platte Pipe Line Company. Other industries making use of a variety of electronic devices and techniques which could be applied to business decision-making in accounting, scheduling, and planning fields are road construction, libraries, and transportation.

The far-reaching potentials of electronics in industry suggests to the author the possibility that "the legal, economic, historic, and social factors at work in this computer business may be leading us out of the area of free competition into that of the regulated public utility." This may be the answer to better service at lower cost for

more business organizations, in management decision-making by electronics. One of the characteristics common to public utilities and computer services which contribute to this suggested possibility is that the more powerful the units of equipment can be made, the less the unit cost of capacity.

PROGRAM FOR COLLEGE PREPARATORY MATHEMATICS

Report of the Commission on Mathematics, College Entrance Examination Board

For those concerned or just interested in the quality of future mathematicians who will be implementing the management science programs of business 10 to 15 years from now, this report on suggested changes in the high school math curriculum will be of great interest.

Recommended changes in high school curriculum

The Commission was appointed in 1955 by the College Entrance Examination Board. Since that time, its members have carefully studied the high school math curriculum in the light of modern mathematical science, and have developed a nine-point program for the guidance of high school math teachers and school administrators. These are:

1. Strong preparation, both in concepts and in skills, for college mathematics at the level of calculus and analytic geometry.
2. Understanding of the nature and role of deductive reasoning--in algebra, as well as in geometry.
3. Appreciation of mathematical structure ("patterns")--for example, properties of natural, rational, real, and complex numbers.
4. Judicious use of unifying ideas--sets, variables, functions, and relations.
5. Treatment of inequalities along with equations.
6. Incorporation with plane geometry of some coordinate geomtry, and essentials of solid geometry and space perception.
7. Introduction in grade 11 of fundamental trigonometry--centered on coordinates, vectors, and complex numbers.
8. Emphasis in grade 12 on elementary functions (polynomial, exponential, circular).
9. Recommendation of additional alternative units for grade 12: either introductory probability with statistical applications, or an introduction to modern algebra.

The entire report may be ordered from the College Entrance Examination Board, c/o Educational Testing Service, Box 592, Princeton, New Jersey. Price: $1.00

SOURCE DATA AUTOMATION—A PROGRESS REPORT

NAVY MANAGEMENT REVIEW, March 1959; pages 16, 17

The Navy is installing SDA (Source Data Automation) in many areas of activity, and is offering periodic training courses and technical help in setting up the system. SDA is the familiar idea of mechanizing basic paperwork at the source. Such papers as personnel forms, supply forms, job-order writing, progress reports, and similar documents are reproduced in punched paper tape, punched tags, or punched cards at their first writing (or typing) operation. The tapes, tags, or cards may then be used to transmit information over communication equipment, to prepare other paperwork, or as input to computing systems. The Navy expects SDA to be used eventually in most of its paperwork areas.

LEGAL SNAG LOOMS FOR AUTOMATED LITERATURE

CHEMICAL WEEK, March 7, 1959; pages 103, 104

The National Science Foundation's Scientific Information Council and the Library of Congress are both pondering the question of copyright infringement in the use of scientifically filed data by researchers. Since information filed electronically generally comes from published sources, there may be a chance that retrieval and reproduction for research use is an infringement. The Library of Congress is preparing recommendations for copyright law revision to answer this question.

NEW COMPUTER PUBLICATION FROM GERMANY

"Elektronische Rechenanlagen" is the name of a new magazine published in Germany. The first issue contains a description of an airlines reservation system, an article on transistor circuitry, and descriptions of American and European computers. Short resumes of the two main articles are given in English. The overall approach of the publication appears to veer toward hardware rather than applications. For information, write to: R. Oldenburg, 8 Rosenheimer Strasse, Munich, Germany.

HONEYWELL 800 ORDERED BY N.Y. BLUE CROSS

Associated Hospital Service of New York has ordered a Honeywell 800 transistorized computer system from Datamatic, to be delivered in October 1960. The equipment will process the complete Blue Cross record file of more than 3,100,000 contracts at least twice a day.

Applications

BRITISH FIRM POINTS WAY TO INTEGRATED ADP

AUTOMATIC DATA PROCESSING, March 1959; pages 26-29.

Factory 1B of International Computers and Tabulators Ltd. is using its own HEC 1201 for control of production, plant loading, and stock levels. The system follows the method familiar in some of the advanced systems in the U.S., that of exploding assemblies into parts requirements, converting the sales figures into production requirements, scheduling, machine loading, and keeping stock inventory up-to-date. Production requirements are scheduled for 21 months ahead; inventory requirements are established for 20 weeks lead time. Plant capacity is also automatically figured by the computer, so that longest operations are loaded first.

The plant has 500 employees, and makes about 700 end products plus 500 piece parts for other company factories. The plant is serving as a "guinea pig" factory for the system, which will be extended to the other factories in the group if successful. The plan took two years to prepare.

Programing

DO-IT-YOURSELF COMPUTING

John Lowe, Douglas Aircraft Co., Santa Monica, California
COMPUTING NEWS, April 1, 1959; pages 9, 10

Since electronic computers are standardized pieces of equipment, it is up to the individual users to design the system which will "express [the organization's] individuality and to tailor things to its own needs. But there seems to be an increasing sentiment that the system, almost as much as the machine, is in the province of the manufacturer and that the user should expect to receive a 'package' consisting of both machine and system all tied up in a pretty red ribbon.... The manufacturer, with the best will in the world, cannot tailor systems to the need of each user.... The main business of the manufacturer, at least in these areas, is to sell machines and it is unlikely that his people will have the viewpoint of the user."

The user should, therefore devise and code his own system, regardless of the expense, for best results.

ENGLISH TO BRAILLE TRANSLATION ON IBM 704

IBM Corporation has cooperated with the American Printing House for the Blind to develop a procedure for translating English text into Braille and automatically casting the Braille text into book plates for printing. The method will help make up for a serious shortage of skilled Braille translators.

The text is first keypunched into IBM cards. The cards are then fed into the IBM 704 which has stored in its memory the program for the translation. The translated text is punched into cards by the computer, which are then fed into a printer to reproduce the Braille symbols above the English text for editing purposes. The corrected deck of punched cards is fed to an embossing machine which creates metal plates for the rotary press.

Table look-up method

The programing technique used is that of table look-up. The table is a modified alphabetical listing of the words or parts of words which cannot be converted on the simple letter-for-letter basis of Grade One Braille. Braille consists of 63 combinations of six raised dots to represent not only the alphabet, numerals and punctuation marks, but also 183 special contractions and abbreviations, similar to written shorthand.

Each entry of the table is recorded as a magnetic pattern in the same code as the incoming information. The computer scans the table one letter at a time, looking for a matching entry. For each table listing, the computer also has a series of instructions on what to do whenever the entry matches with some part of an input word or part of word.

An example translation

For example, take the word CHANGEABLE. The human translator would write down the word as seven Braille characters, with CH and BLE as contractions represented by a single Braille character. Braille also contains the contraction EA, but the translator would know it cannot be used since in this word the E belongs to a root word, CHANGE, while the A belongs to the suffix, ABLE.

The computer performs the translation in this manner: First the computer performs a search in the "C" table, looking for a matching entry to CHANGEABLE, CHANGEABL, CHANGEAB, etc. A match is found on the letters CH, with program instructions to use the standard Braille contraction for CH. Next the computer makes routine tests to see that there are no violations of the many special Braille rules concerning use of contractions at beginning of a word or other such conditions. Then the CH is converted into Braille and held in temporary storage for the rest of the word.

The remainder of the word, ANGEABLE, is then used as input for lookup in the "A" table. No match is found, and the A symbol in Grade One Braille is stored with the CH symbol. Similar searches and

storages on N and G bring the lookup to EABLE, where a match is found for the entire remainder, along with instructions to transcribe into three Braille characters, E A BLE. The purpose of this entry is to avoid automatically using the EA contraction in a case where it would be incorrect.

After the visual proofing operation, the computer takes over again for automatic processing of editorial corrections. The system also provides for an automatic count of Braille symbols per line, lines per page, and page numbers.

((From a news release.))

PROGRAMMING THE IBM 650 MAGNETIC DRUM COMPUTER AND DATA-PROCESSING MACHINE

Richard V. Andree, University of Oklahoma
Published by Henry Holt and Co., Inc., 1958. $2.95

Here is a good, inexpensive, workman-like book on programing the IBM 650. It is written so that the beginning student may learn the machine without having access to one, and before he digs into the 650 programer's manuals. Simple exercises and programing practice are given from the first introductory lesson. Explanations are clear and simple, and illustrations are plentiful. This appears to be an excellent book for those who wish to learn programing on their own, and for beginning classes.

PROGRAMMING FOR AN AUTOMATIC DIGITAL CALCULATOR

K. H. V. Booth, Birkbeck College, University of London, England
Published by Academic Press Inc., 1958. $7.50

The APEXC computer at Birkbeck College is used as a basis for instruction in programing a two-address computer. The approach is primarily for scientific applications. Instruction is detailed and very clearly presented.

Equipment

A MACHINE THAT LEARNS FROM EXPERIENCE

DATA PROCESSING, April-June 1959; pages 106-112.

The Solartron Electronic Group, Ltd., of Thames Ditton, Surrey, England, is producing its Solartron automatic keyboard instructor (Saki) for rapid training of keypunch operators. The device is designed to instruct the operator in the use of the keyboard. Other similar devices are being developed to teach adding machine and typewriter and teletype keyboards. It is anticipated that similar devices will in the future be used for such tasks as providing automatic control in the continuous-processing industries.

Saki consists of three units--the control unit, the display unit, and the keyboard. An actual keyboard from the keypunch machine to be learned is modified to work with the remainder of the equipment, so that the operator obtains the correct "feel" of the keyboard to be operated.

The display unit is fitted with two panels which can be illuminated. The lower panel is a duplicate of the keyboard, and the upper panel is a transluscent screen with four rows of characters, constituting the training program. A light appears behind each character in the top row in turn, and behind the corresponding "key" on the duplicate keyboard.

SAKI teaches keyboard at student's learning rate

When the pupil depresses the proper key, the light goes out on both panels, and the next character lights up, with a corresponding light on the "keyboard." As the pupil responds more quickly, the lights change more quickly, and the "keyboard" lights dim and finally go out altogether. If the pupil makes an error, the "keyboard" lights come on again, and the device slows down until the pupil regains or increases her proficiency. When the pupil is able to repeat the top line exercise correctly and at a certain speed, the device shifts to the next row, and repeats this exercise until the required ability is reached.

The company estimates that one hour of training on Saki is the equivalent of three hours' training by conventional methods. Other advantages are the elimination of verification of punched cards, the fact that it teaches touch typing from the beginning, and only a minimum of human supervision is needed. Pupils train for about 45 minutes at a time. The transluscent cards can be replaced with other cards, and the program is changed at the same time by the replacement of a program block. A pen recorder may be attached to the machine to show the progress of the pupil. This is an aid in personnel selection. Price of the Saki is about $1,600. This does not include the cost of the modified keypunch keyboard. Extra exercise cards and program blocks cost about $25.

PILOT DATA PROCESSOR NOW UNDER CONSTRUCTION AT NBS

NBS TECHNICAL NEWS BULLETIN, February 1959; pages 38-39

The logical design of PILOT ((see DPD, May 1959, page 14, "Organizing a Network of Computers")) provides for exploring a wide range of applications: 1) business applications such as accounting, record-keeping, and information retrieval; 2) scientific data reduction; 3) control applications in conjunction with analog or instrumentation facilities; 4) data-processing network applications where the system communicates with other digital computers to form a communication network for collaborating on large-scale problems.

Unique features of PILOT include: 1) extremely flexible controls for communicating with humans or data-collecting instruments; 2) a wide range of internal processing formats which will save time in programing problems; 3) a high internal data-manipulation rate which is the result of logical design rather than an increase in the basic rate.

The system consists of three computers, each of which will work cooperatively on that portion of a problem for which it is best suited. The primary and secondary computers each have 16 basic instructions. The third computer will specialize in editing, inspecting, and modifying input and output data. All three will share access to a common high speed internal memory. A wide variety of digital and analog input-output devices will be supervised by PILOT, which may, on an unscheduled basis, interrupt or redirect its over-all program automatically in order to assist or manage them. These impromptu inter-changes of information may be instigated either by PILOT or by humans.

"TRANSACTER" TIES PRODUCTION LINE TO OFFICE

OFFICE MANAGEMENT, April 1959; pages 38, 39

Stromberg Time Corporation has installed its first "Transacter" at the Naval Gun Factory in Washington. The equipment consists of the "Transacter," which accepts and transmits production information from individual workers, and the "compiler," which receives data from as many as 50 transacter units and records them on punched tape. In a production control system, a worker would get from his foreman punched cards carrying fixed data concerning the job performed and his identification number. As he inserts each job card in the transacter, he adjusts dials on the front to enter variable data. He can check his accuracy by observing a visual readout before pressing the transmit key. The machine transmits the inserted data plus the date, time, and shift, to the compiler, where it is recorded on punched paper tape.

DUAL CODE PERFORATION—A SUPPLEMENT TO MAGNETIC CHARACTERS

John E. Jones, Cummins-Chicago Corporation
JOURNAL OF MACHINE ACCOUNTING, April 1959; pages 43-45

Between the large banks which will use magnetic ink character recognition in check processing, and the very small banks which will be unable to afford any reading equipment, are "some 6000 or 7000 banks that could benefit greatly from an inexpensive common language ....legible to humans and to machines, and completely compatible with magnetic coding."

It is suggested that this common language be Dual Code Perforation, as devised by Cummins-Chicago. Perforated arabic characters are used for information to be read by humans. Simultaneously, a five-channel code is punched for information which may be completely machine-read. Machines will soon be available which can translate between perforated code and magnetic code. Perforating equipment is relatively inexpensive: perforators for tellers' cages will cost from $50 to $150; readers from $1500 to $10,000. Sorters will range from $12,000 to $15,000, depending upon attachments.

Dual Code Perforation is suggested for installment payment coupons, money orders, time payment, mortgage accounting, Christmas Clubs, and savings accounting.

((See DPD January 1959, page 13, "Dual Code Perforation: A Practical Common Language."))

WESTERN ELECTRIC UNVEILS NEW DATA TRANSMISSION DEVICE

OFFICE AUTOMATION NEWS BULLETIN, February 28, 1959

The Dataphone transmits data from punched and magnetic tape over regular telephone channels. A new feature for use in long distance ordering situations is an identification punched card which may be inserted into the Dataphone set to establish the identity of the sender. Then additional cards may be inserted for items to be ordered with the quantity entered on the instrument's keyboard. The device is adaptable to use by salesmen, credit card users, or for employees reporting in or leaving work at remote locations.

Comment

THE WEAK SPOT IN AN EDP SYSTEM

Much attention has been paid by systems designers and hardware manufacturers to the problems of input in EDP systems. So far, no practical way has been found of completely eliminating the human element. The human being at some point must still be the instigator of activity in this world, no matter how remote from the system, or how mechanized and self sustaining the activity may subsequently become.

Has the typewriter been improved to the limit?

While transaction recorders are finding more uses as input devices, the typewriter still reigns supreme as a versatile instrument in the hands of thousands of typists. A girl does not have to be exceedingly fast or accurate to hold down a job as a typist: too many are needed for employers to be overly fussy about abilities. But computers are. They demand both speed and accuracy in the information they devour, if their product is to satisfy their human masters.

Is the typewriter most of us take for granted the "best" design for its purpose? Have we grown so accustomed to its increasing mechanical excellence that we think there is no possible improvement that could be made on the concept of "typewriter"?

Mechanical improvements have followed each other rapidly. But the keyboard has remained static, a mishmash of letters and symbols placed with regard neither for the frequency and order in which the letters appear in the words nor for the typist's fatigue. The average good typist must move her fingers from 12 to 20 miles a day to get around the keyboard. The left hand does more work than the right, the weaker fingers must work harder than the strong ones.

There are better ways

The Dvorak Simplified Keyboard (DSK) eliminates much of this fatiguing activity. But business, government, and educators are sluggish about introducing it. The Navy tested it successfully in 1944 but put it aside because of the press of war. Later the General Services Administration conducted a test which, in the opinion of DSK proponents, was performed on a test group too small to provide accurate results.

Because of the importance of the typewriter in providing fast and accurate input for EDP, systems people should view the typewriter with an unprejudiced eye. Not only should the keyboard be eyed with suspicion. The entire instrument should be considered as a totally new design idea. For example, students of an industrial design teacher at the Ontario College of Art followed his admonition to "re-examine keyboard controls in relation to human hand and fatigue factors. Design a new control board which need not necessarily incorporate the typewriter mechanism itself." One solution turned the keyboard about so that the operator played it something like an accordion. The keyboard is connected with the typewriter

itself by an extruded plastic pipe containing printed wiring. Another resulting design is for one-hand operation, with keys separated by color into small groups. When the line of type appears in a window at the top, the operator presses the print key which prints the whole line and advances the paper. The machine lies flat and is gently concave to fit the hand.

Perhaps we will never play a typewriter like an accordion, but we can approach the purpose and function of the instrument in the same spirit. Naturally, any new concept of typewriters will cause an upheaval in the status quo. Some objections to the DSK are given below, as examples of what may be expected from such a change. The answers are those given by DSK proponents.

Objection: You have to learn to type originally on the new keyboard.

The DSK is an improvement on present models

Answer: Not so. The GSA tests proved it was possible to achieve former speeds on the new keyboard in six weeks. (However, the test was set up to test continued typing improvement of retrained typists against improvement of experienced standard typists. Space limitations prevent us from explaining the reason for DSK experts' opinions that the test was not designed to give a fair picture. However, in reading the GSA report, we had some reservations in accepting the test conclusions as an accurate interpretation of the statistics.)

Objection: Typists can achieve 100 words per minute on a standard electric machine. Why try to go faster?

Accuracy is a reason for change

Answer: One systems man offered to pay $100 a week for any typist who can maintain this speed. Moreover, speed alone is not the chief virtue of the DSK. Accuracy is more important, and the importance of fast, accurate input into EDP systems calls for any improvement possible. The aforementioned systems man says, "The keyboard and its errors are an integral, and to my mind permanent, part of the new electronic technology. It is the most problematic and unsatisfactory part of the electronic system and at the same time the area to which least thought has been devoted. There are dozens of improvements that any thinking person could make in the present typewriter; it's a wide open area...."

Objection: All the typists would have to retrain

Answer: Turnover is high. In three years the typing force (if business schools cooperated) would be DSK-trained. DSK supporters, moreover, do not advocate retraining all typists for mass replacement of typewriter keyboards. Neither do they advocate using both keyboards interchangeably, although we know of a chemist who does so.

Objection: Businesses would have to carry both keyboards in inventory.

Answer: There are always spares in inventory anyway. If these included some DSK's, it would be no more expensive. In the long run, it would be cheaper and more efficient.

The DSK is not necessarily THE ONE answer to better typing and more efficient typewriters. Perhaps the next real advance will be a radical one like those of the Ontario College of Art. But any improvement must begin with the willingness of business, government, and educators to view the present machine objectively and try the proffered improvements. EDP systems cost up to the millions of dollars. Can management justify this expenditure when the input component is less than maximum in efficiency?

A final advantage

One final advantage of the DSK: Judging by the experience of an acquaintance of ours (who taught herself the DSK in two weeks!), burglary insurance could be eliminated. Our friend had a Royal portable changed to the DSK, and since she was learning, she had blank keys installed. One night burglars entered her apartment, and apparently tested the typewriter before deciding to burgle it. When "the quick brown fox jumped over the lazy dog" came out "kjd xfgiv nos,l ysb cfmrdh s.do kjd pa/t hsu" they left in a hurry... without the Royal. She has never felt the need to insure it.

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Training

Industrial Engineering Institute

Date: June 1-12, 1959
Place: Purdue University
Courses: Production Planning and Control, Production Management Principles, Work Measurement, Mathematical Programing with Industrial Applications, Communication Improvement, Data Processing and Automation, Methods Analysis, Industrial Quality Control
Fee: $250
Information: Prof. J. A. Ritchey, Dept. of Industrial Engineering, Purdue University, Lafayette, Indiana

Basic Programming for Medium-Size Computers in Business (IBM 650)

Date: June 8 through July 29, 1959, 6:15 p.m.
Place: Management Institute, New York University
Information: Dr. D. S. Philipps, Director, The Management Institute, New York University, Washington Square, New York 3, N. Y.

Automation in California, A Conducted Tour of Practical Applications

Date: June 15-27, 1959
Place: Tour leaving San Diego, and visiting EDP installations and computer manufacturers in Los Angeles, Pasadena, San Francisco, Palo Alto, and other points
Fee: $125 (including rooms, but excluding meals)
Registration deadline: April 15, 1959
Information: Dr. E. Dana Gibson, San Diego State College, San Diego, California

Industrial Engineering Seminars, Cornell University

Date: June 16-19, 1959
Place: Cornell University, Ithaca, New York
Seminars on Industrial Management, Manufacturing Engineering, Engineering Administration, Small Plant Management, Methods and Work Measurement, Computers in Production Planning, Applied Industrial and Engineering Statistics, Statistical Aspects of Component Reliability. Also general sessions.
Information: Andrew Schultz, Dept. of Industrial and Engineering Administration, Upson Hall, Cornell University, Ithaca, New York

University of Michigan Engineering Summer Conferences, including these two courses of interest to programing and systems engineering persons: "Computer Programming and Artificial Intelligence," and "Foundations and Tools for Operations Research and the Management Sciences." Other courses are designed particularly for the computer design engineer. Fee for each conference mentioned above is $225. Dates for each are June 29 through July 10, 1959. For information, write to: Engineering Summer Conferences, 2038 East Engineering Building, University of Michigan, Ann Arbor, Michigan.

UNIVERSITY OF MICHIGAN LIBRARIES

Applications of Probability Theory to Operations Research

Date: June 22 - July 3, 1959
Place: M. I. T.
Fee: $275
Prerequisite: Calculus and differential equations
Information: Director of Summer Session, M. I. T., Cmabridge 39, Mass.

Two-week course for practicing engineers in scientific and engineering computation

Date: July 6-17, 1959
Place: Case Institute of Technology, Cleveland, Ohio
Fee: $375
Information: Dr. James R. Hooper, Jr., Director of Special Programs, Case Institute of Technology, Cleveland 6, Ohio

Summer Course in Crystallographic Computing on the IBM 650

Date: July 13-17, 1959
Place: University of Pittsburgh
Content: Theory and practice of crystal structure analysis and electron density calculations. Familiarity with the IBM 650 is helpful but not essential.
Fee: $100. Registration is limited to 30 participants.
Information: William B. Kehl, Director, Computation & Data Processing Center, 825 Cathedral of Learning, The University of Pittsburgh, Pittsburgh 13, Pa.

Introduction to Programing, Seminar

Date: July 20-31, 1959
Place: George Washington University
Information: School of Engineering, George Washington University, Washington, D. C.

"Electronic Data Processing for Business and Industry" (Course 10) presented by Richard G. Canning

Date: July 27-31, 1959
Place: New York (Barbizon Plaza Hotel)
Fee: $250
Program: Emphasis on the applications aspect of electronic data processing. Four guest lecturers on specific applications.
For whom: Management personnel charged with setting up an EDP system
Information: Richard G. Canning, 1140 South Robertson Blvd., Los Angeles 35, California

1959 Statistical Methods in Industry Course

Place: University of California at Los Angeles
Program: Basic Course in Statistical Quality Control, August 3-14
The Advanced Course, in Industrial Statistical Techniques, August 3-14
The Industrial Reliability Course, July 27 - August 14
Information: Professor Edward P. Coleman, Department of Engineering, University of California, Los Angeles 24, California

"Frontier Research in Digital Computers," two-week summer conference

Date: August 17-28, 1959
Place: University of North Carolina, Chapel Hill, N. C.
Courses: Introductory course, "Modern Uses of Digital Computers," for beginners in the field
Advanced courses: "Advanced Numerical Analysis"
"Automatic Programming and Artificial Intelligence"
Fees: Introductory course, $150; Advanced courses, $200
Visiting lecturers include professors from France, Germany, Russia, Switzerland and the United States
Information: The Director, Research Computation Center, University of North Carolina, Chapel Hill, N. C.

Computer Programing (650), non-credit summer course at University of Florida

Information: Dr. H. A. Meyer, Director
Statistical Laboratory
Box 3568, University Station
Gainesville, Florida

Meetings

International Conference on Information Processing

Date: June 13-23, 1959
Place: Paris, France (UNESCO House)
Information: U. S. Committee for the First International Conference on Information Processing, Box 4999, Washington 8, D. C.

International Accounting Conference

Date: June 21-24, 1959
Place: New York (Waldorf-Astoria)
Information: John L. Doran, National Association of Accountants, 505 Park Avenue, New York 22, N. Y.

British Computer Society First Annual Conference

Date: June 22-25, 1959
Place: Cambridge, England
Information: British Computer Society, c/o University Math. Lab. Corn Exchange Street, Cambridge, England

NMAA National Conference

Date: June 24-26, 1959
Place: St. Louis, Missouri (Chase-Park Plaza Hotels)
Information: National Machine Accountants Association, 208 South Main Street, Paris, Illinois

Sixth Annual Symposium on Computers and Data Processing, sponsored by Denver Research Institute

Date: July 30, 31, 1959
Place: Estes Park, Colorado (Stanley Hotel)
Program: Four half-day sessions devoted to each of following: Components, Logical Design, Computer Design, Systems Organization
Information: Denver Research Institute
University of Denver, Denver 10, Colorado

1959 ACM National Conference

Date: Summer, 1959
Place: M.I.T.
Information: F. Verzuh, Massachusetts Institute of Technology, Cambridge, Mass.

Bendix G-15 Users Exchange Organization

Date: September 16-18
Place: Palo Alto, California

ISA Conference

Date: September 21-25, 1959
Place: Chicago, Illinois
Information: Instrument Society of America, 313 Sixth Avenue
Pittsburgh 22, Pennsylvania

1959 International Systems Meeting, Systems and Procedures Association of America

Date: October 12-14, 1959
Place: Toronto, Ontario (Royal York Hotel)

International Automation Exposition-Congress

Date: November 16-20, 1959
Place: New York (Trade Show Bldg.)
Information: Richard Rimbach, 845 Ridge Ave., Pittsburgh 12, Pa.

References

The publishers of books and periodicals mentioned in this issue of DATA PROCESSING DIGEST are listed below for your convenience in writing for more complete information.

Academic Press Inc.
111 Fifth Ave.
New York 3, New York

Automatic Control
430 Park Ave.
New York 22, New York

Automatic Data Processing
Mercury House
109-119 Waterloo Rd.
London SE1, England

Behavioral Science
Mental Health Research Institute
University of Michigan
Ann Arbor, Michigan

Chemical Week
330 West 42nd St.
New York 36, New York

Computers and Automation
815 Washington St.
Newtonville 60, Mass.

Computing News
12805 - 64th Ave. South
Seattle 88, Washington

Data Processing
Iliffe & Sons Ltd.
Dorset House, Stamford St.
London SE1, England

Henry Holt & Co., Inc.
383 Madison Ave.
New York 17, New York

Journal of Machine Accounting
208 South Main St.
Paris, Illinois

National Retail Merchants Assoc.
100 West 31st St.
New York 1, New York

Navy Management Review
Supt. of Documents
U.S. Government Printing Office
Washington 25, D. C.

NBS Technical News Bulletin
Supt. of Documents
U.S. Government Printing Office
Washington 25, D. C.

Office Automation Newsletter
Automation Consultants
155 Fifth Ave.
New York 10, New York

Office Management
212 Fifth Avenue
New York 10, New York

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